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Extraterrestrial native iron in deep-water sediments of the NW Atlantic: Evidence from thermomagnetic analyses

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Abstract

© 2015, Pleiades Publishing, Inc. Thermomagnetic determination of the content and composition of native iron was accomplished in Miocene-Late Jurassic sediments and sedimentary rocks of the NW Atlantic recovered by DSDP holes 386, 387, 391A, and 391C. Native iron particles are ubiquitous therein. Presence of a zero group in the bar chart of native iron concentrations is a global feature of the cosmic particle distribution caused by small values of cosmic dust fluxes relative to sedimentation fluxes. Based on the Ni content, native iron is divided into two groups: (1) pure iron; (2) iron with Ni admixture from 3 to 17% (mode 4 to 5% Ni). The global pattern of Ni distribution in the native iron is emphasized by similarity of bar charts for the Atlantic and Eurasian sediments. Similarity of bar charts of the Ni distribution in the metallic portion of meteorites testifies to a common (extraterrestrial) origin of native iron in bottom sediments and meteorites. Concentrations of native iron lack any correlation with the rock composition and age, but high contents of native iron (up to 10−3%) are recorded in deposits related to pulsatory sedimentation (turbidites, laminites), where this element was likely accumulated intensely during slow (or zero) sedimentation intervals between the geologically instantaneous episodes of accumulation.

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